IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application No. 10/530,129

Applicant: VERSCHUEREN

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Examiner: Gilliam, Barbara Lee

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Customer No.: 23460

Commissioner for Patents
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REPLY TO OFFICE ACTION

Sir:

In reply to the Office Action dated February 8, 2007, please enter the following amendments and consider the following remarks.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of making a heat-sensitive lithographic printing plate precursor comprising the steps of

(i) providing a web of a lithographic support having a hydrophilic surface;

(ii) applying a coating comprising a phenolic resin on the hydrophilic surface of the web;

(iii) drying the coating;

(iv) a heating step wherein the web temperature is maintained above the glass transition temperature of the phenolic resin Tg during a period of between 0.1 and 60 seconds;

(v) an active cooling step wherein the web temperature is reduced at an average cooling rate which is higher than if the web would be kept under ambient conditions ~~but not higher than~~ and which is between 0.5°C/s and 30°C/s; and

(vi) winding the precursor on a core or cutting the precursor into sheets.

2. (Previously Presented) The method according to claim 1 wherein the average cooling rate is not higher than 20°C/s.

3. (Previously Presented) The method according to claim 1 wherein the average cooling rate is not higher than 10°C/s.

4. (Previously Presented) The method according to claim 1 wherein at the beginning of the cooling step the web temperature is higher than Tg and wherein during the cooling step the web temperature is reduced from T1 to T2, T1 being higher than Tg and T2 being lower than Tg, at an average cooling rate which is lower than 10°C/s.

5. (Previously Presented) The method according to claim 4 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s; and

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s.

6. (Previously Presented) The method according to claim 4 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s;

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s; and

-in a third phase from T2 to about ambient temperature at an average cooling rate of at least 10°C/s.

7. (Previously Presented) The method according to claim 4 wherein the cooling from T1 to T2 proceeds at an average cooling rate which is lower than 5°C/s.

8. (Previously Presented) The method according to claim 4 wherein T1 is Tg+20°C and T2 is Tg-20°C.

9. (Previously Presented) The method according to claim 4 wherein T1 is Tg+10°C and T2 is Tg-10°C.

10. (Previously Presented) The A method according to claim 1 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

11. (Previously Presented) The method according to claim 2 wherein at the beginning of the cooling step the web temperature is higher than Tg and wherein during the cooling step the web temperature is reduced from T1 to T2, T1 being higher than Tg and T2 being lower than Tg, at an average cooling rate which is lower than 10°C/s.

12. (Previously Presented) The method according to claim 3 wherein at the beginning of the cooling step the web temperature is higher than Tg and wherein during the cooling step the web temperature is reduced from T1 to T2, T1 being higher than Tg and T2 being lower than Tg, at an average cooling rate which is lower than 10°C/s.

13. (Previously Presented) The method according to claim 11 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s; and

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s.

14. (Previously Presented) The method according to claim 12 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s; and

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s.

15. (Previously Presented) The method according to claim 11 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s;

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s; and

-in a third phase from T2 to about ambient temperature at an average cooling rate of at least 10°C/s.

16. (Previously Presented) The method according to claim 12 wherein during the cooling step the web temperature is reduced

-in a first phase down to T1 at an average cooling rate of at least 10°C/s;

-in a second phase from T1 to T2 at an average cooling rate which is lower than 10°C/s; and

-in a third phase from T2 to about ambient temperature at an average cooling rate of at least 10°C/s.

17. (Previously Presented) The method according to claim 5 wherein the cooling from T1 to T2 proceeds at an average cooling rate which is lower than 5°C/s.

18. (Previously Presented) The method according to claim 6 wherein the cooling from T1 to T2 proceeds at an average cooling rate which is lower than 5°C/s.

19. (Previously Presented) The method according to claim 5 wherein T1 is Tg+20°C and T2 is Tg-20°C.

20. (Previously Presented) The method according to claim 6 wherein T1 is Tg+20°C and T2 is Tg-20°C.

21. (Previously Presented) The method according to claim 7 wherein T1 is Tg+20°C and T2 is Tg-20°C.

22. (Previously Presented) The method according to claim 5 wherein T1 is Tg+10°C and T2 is Tg-10°C.

23. (Previously Presented) The method according to claim 6 wherein T1 is Tg+10°C and T2 is Tg-10°C.

24. (Previously Presented) The method according to claim 7 wherein T1 is Tg+10°C and T2 is Tg-10°C.

25. (Previously Presented) The method according to claim 2 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

26. (Previously Presented) The method according to claim 3 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

27. (Previously Presented) The method according to claim 4 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

28. (Previously Presented) The method according to claim 5 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

29. (Previously Presented) The method according to claim 6 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

30. (Previously Presented) The method according to claim 7 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

31. (Previously Presented) The method according to claim 8 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

32. (Previously Presented) The method according to claim 9 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

33. (Previously Presented) The method according to claim 11 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

34. (Previously Presented) The method according to claim 12 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

35. (Previously Presented) The method according to claim 14 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

36. (Previously Presented) The method according to claim 15 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

37. (Previously Presented) The method according to claim 16 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

38. (Previously Presented) The method according to claim 17 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

39. (Previously Presented) The method according to claim 18 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

40. (Previously Presented) The method according to claim 21 wherein the heating step is carried out by blowing hot air or steam onto the precursor or by exposing the precursor in infrared or microwave radiation.

This listing of claims replaces all prior versions, and listings, of claims in the application.

REMARKS

Reconsideration of the pending application is respectfully requested in view of the foregoing amendment and the following remarks.

Status of the Application

Claims 1-40 are currently pending. Claim 1 has been amended to more clearly describe the subject matter Applicant considers as his invention. As this amendment is fully supported by the specification and claims as filed, e.g., page 8, no new matter has been introduced into the application by way of this amendment.

Summary of the Office Action

The Office Action opens by provisionally rejecting claims 1-40 under the judicially-created doctrine of non-statutory obviousness-type double patenting over claims 1-40 of two copending U.S. patent applications, i.e., nos. 10/530,130 and 10/530,394

Claims 1-40 are rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,723,489 (Aburano et al.).

Claims 1-40 are further rejection under 35 U.S.C. § 103(a) as obvious over EP Published Application EP 1 074 386 A2 (Huang et al.).

Discussion

Applicants respectfully submit that the claimed method is patentable over the prior art of record, and that the substantive rejections should be withdrawn.

Independent claim 1 describes a method of making a heat-sensitive lithographic printing plate precursor. This method comprises the steps of: (i) providing a web of a lithographic support having a hydrophilic surface; (ii) applying a coating comprising a phenolic resin on the hydrophilic surface of the web; (iii) drying the coating; (iv) a heating step wherein the web temperature is maintained above the glass transition temperature of the phenolic resin Tg during a period of between 0.1 and 60 seconds; (v) an active cooling step wherein the web temperature is reduced at an average cooling rate which is higher than if the web would be kept under ambient conditions and which is between 0.5°C/s and 30°C/s; and (vi) winding the precursor on a core or cutting the precursor into sheets.

In contrast to the foregoing method, Aburano et al. teaches cooling of a precursor at a much slower rate. For example, and under the theory advanced in the Office Action, Aburano et al. teach that the precursor is cooled to a temperature of 30°C or less most preferably in no more than 20 minutes (regardless of the cooling method used). *See, e.g., col. 4, lines 19-23.* Aburano et al. further teaches that the precursor's initial temperature (after heating and before cooling) is most preferably at least 50°C (a range of 50°C-70°C for precursors which comprise novolac resins), it being further preferred that the temperature not exceed 110°C. *See, e.g., col. 5, lines 26-51.* Thus, even if it were assumed that one skilled in the art would select temperatures for heating and cooling that would result in the broadest temperature range (110°C-30°C), cooling the precursor over this range in 20 minutes provides a cooling rate of about 0.07°C/s, this rate being an order of magnitude less than the claimed cooling rate of 0.5°C/s to 30°C/s. Of course, such a selection of temperatures is not taught by Aburano et al.; one skilled in the art using a conventional novolac-based precursor is instead taught to heat the precursor to a maximum of 50°C to 70°C before cooling to 30°C over 20 minutes, yielding a maximum cooling rate of 0.03°C/s. Again, this is a rate that is an order of magnitude less than that required by the claimed method.

The Office Action argues that the Examples teach the heating of precursors comprising novolac resins to temperatures varying between 110°C and 90°C, and up to 150°C, and cooling the heated precursors to 30°C or less in 10 minutes. *See Office Action, pp.4-5.* However, the cited temperatures are not the temperatures of the precursors, but instead of the hot air (90°C-110°C in Example 1) blowing over a precursor, or of the heating chamber of an oven (150°C in Example 2) in which the precursor resides. Because the residence times of the precursors in those environments are so short, measured in seconds (e.g., 21 seconds, 61 seconds), the precursors would not reach the temperatures of their environment. Instead, these precursors would have reached the temperatures described in Aburano et al. as optimal for novolac precursors, i.e., 50°C-70°C, during their short time in residence in each environment. Again, there is no disclosure or teaching in either Aburano et al. example of the temperature of the precursor *per se.* The sole teaching that is provided therein, however, is that the precursor should be heated to 50°C to 70°C. Absent any information concerning the temperature of the precursors, the cooling rate of the precursors in these examples cannot be determined.

For at least these reasons, Applicant respectfully submits that Aburano et al. fails to anticipate the claimed method.

Moreover, there is no teaching is Aburano et al. that would motivate one skilled in the art to increase the cooling rate relative to that disclosed in this reference. In particular, there

is no suggestion in Aburano et al. to further decrease the cooling time relative to that described above. Indeed, the cooling rate of Aburano et al. described above is, without doubt, the maximum cooling rate, as use of the alternative cooling times taught by Aburano et al. (more than 20 minutes) would result in a cooling rate that is much slower than the aforementioned 0.07°C/s rate (the rate ascribed to Aburano et al. under the theory proposed by the Office Action). As there is simply no suggestion in Aburano et al. to increase the cooling rate, there is no basis for entry of an obviousness rejection.

Huang et al. also fails to render the claimed methods obvious. Huang et al. teach the use of a relatively slow cooling rate for heated precursors. Indeed, the Office Action admits that the cooling period is at least one hour, most preferably at least 6 hours, and suitably the cooling rate is not greater than 1°C/minute (about 0.02°C/s), most preferably not greater than 0.2°C/min. *See Office Action, p. 6, citing Huang et al. at ¶¶ [0033]-[0034].* There is no teaching or suggestion in Huang et al. to increase this cooling rate; indeed, the Office Action has not identified any such teaching.

For at least the foregoing reason, Applicant submits that Huang et al. fails to render the claimed method obvious.

Finally, Applicant submits herewith two terminal disclaimers addressing the obviousness-type double patenting rejections.

Conclusion

As Applicant believes the application is in proper condition for allowance, the Examiner is respectfully requested to pass the application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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